REMARKS

§ 101 Rejection

Applicants respectfully traverse the rejection of claims 1-29 under 35 U.S.C. § 101 as directed to non-statutory matter. The office action rejects the claims as lacking a practical application because, according to the office action, the coefficients of the second column matrix do not provide a practical application. However, as recited by the claims, the coefficients of the second column matrix correspond to values of a physical quantity representing a secondary wave emitted by an obstacle in said region of three-dimensional space, and thus provide a practical application.

As described by the specification, the values of the physical quantity of the secondary wave at a location in space provide useful information on the state of the object or a surrounding field of the object. In particular, the physical quantity may be, for example, an electrostatic potential, a magnetic potential, an acoustic pressure, etc. Thus, in one application, the claimed method may be used to display a map of an electrostatic potential, a magnetic potential, an acoustic pressure, etc. surrounding the obstacle. Another application of the values of the physical quantity may be to find an optimal position for a sensor used to monitor a state of the object. In another application, the values of the physical quantity may be used to determine a inhomogeneity of the obstacle. Thus, the recited coefficients of the second column matrix that correspond to values of a physical quantity of a secondary wave emitted by an obstacle in a region of three-dimensional space provide a useful, tangible, and concrete result. It follows that each of claims 1-29 are directed to patentable subject matter under 35 U.S.C. § 101 and the rejection should be withdrawn.

Applicants add new claim 30, which reads substantially the same as claim 1, except that new claim 30 recites that the coefficients of said second column matrix are evaluated to determine at least one of an impurity on the surface of the obstacle, an optimum position of a sensor for determining a characteristic of the obstacle, or to display a map of a region of three dimensional space indicating the value of the physical quantity at a plurality of locations of the three dimensional space. (Please refer to part d) of the claim). For the same reasons as described above, claim 30 recites patentable subject matter under 35 U.S.C. § 101.

§103 Rejections

Applicants respectfully traverse the rejection of the pending claims as obvious in view of Placko et al. (SPIE Proceedings Vol. 4335, July 2001). Each of the pending claims recites meshing a surface of an obstacle into a plurality of surface samples, where the obstacle receives a main wave and emits a secondary wave. Each of the pending claims also recite orienting a hemisphere inwardly for a propagation of a secondary wave in a second medium, and outwardly for a propagation of the secondary wave in a first medium (where the main wave propagates in the first medium).

Tsingos fails to disclose or suggest meshing a surface of an obstacle into a plurality of surface samples, where the obstacle receives a main wave and emits a secondary wave, nor is it cited for this purpose. Thus, the office action relies on Placko et al. for this disclosure. However, Placko et al. also fails to disclose or suggest the recited limitation. In particular, the office action points to Figure 2 of Placko et al. for disclosing meshing a surface of an obstacle into a plurality of surface samples, where the obstacle receives a main wave and emits a secondary wave. The office action highlights a Figure of an electromagnet (Figure 2) of Placko et al. showing magnetic fields lines flowing from a north pole to a south pole of the magnet and asserts that the south pole represents the recited obstacle. The office action then asserts that the wave emitted by the north pole is "inherently reflected and/or refracted" at the south pole. This assertion is fundamentally incorrect.

Magnetic field sources are fundamentally dipolar in nature, having a north magnetic pole and a south magnetic pole. Thus, the magnetic field is commonly visualized in terms of "magnetic field lines," where the field lines start near one end (e.g., the north pole) and enters near a second end (e.g., the south pole). However, this visualization does not mean that the first pole or second pole reflect a wave, as recited by the pending claims. Instead, each pole, in tandem, produce the field. Thus, the south pole of Placko et al. is not an obstacle, as recited by the pending claims, but rather, an independent emitting source of a main wave. Placko et al. further supports this emitter concept on page 54 by equation 1, which indicates that the magnetic field lines, or flux, is produced by both poles. It follows, therefore, that neither Placko et al. nor Tsingos discloses meshing a surface of an obstacle into a plurality of surface samples, where the obstacle receives a main wave and emits a secondary wave, nor is it cited for this purpose.

The office action cites "Optical Microscopy Primer," http://micro.magnet.fsu.edu/primer/java/reflection/hugens/index.html, (hereinafter, "Optical Microscopy Primer"), which describes the Huygens' principle of wave propagation from a first to a second medium. The office action does not make a formal rejection of any claimed limitation based on this tutorial, however, it appears that the office action cites the reference to teach that the use of hemispheres for conceptualizing waves is obvious based on the Huygens' principle. Applicants respectfully traverse this assertion.

In particular, each of the claimed hemispheres has a predetermined dimension, where the surface of the claimed hemisphere is equal to the surface of the surface sample. Further, each of the claimed hemispheres includes at least one source of the said surface sample. The Huygens' principle, on the other hand, each hemisphere does not have predetermined dimensions. Instead, the Huygens' principle uses hemispheres that continuously grow as the waves travel. Also, the surface of the Huygens hemisphere does not include one source allocated to the said surface sample. In fact, the surface sample of Huygens is associated with a plurality of hemispheres that overlap. In the recited claims, one hemisphere is associated with one surface sample.

Furthermore, each of the claimed hemispheres is oriented in a manner that is different from Huygens. Specifically, the pending claims recite that the hemispheres are oriented inwardly for a propagation of said secondary wave in said second medium (refraction), and outwardly for a propagation of said secondary wave in said first medium (reflection). The hemispheres of Huygens, on the other hand, are oriented outwardly for refraction (illustrated by blue hemispheres) and inwardly for reflection (illustrated by red hemispheres). Thus, the Huygens' principle, as described by the Optical Microscopy Primer, does not disclose or teach the recited hemispheres.

Because neither Placko et al., Tsingos, or the Optical Microscopy Primer disclose or teach meshing a surface of an obstacle into a plurality of surface samples or orienting a hemisphere associated with a surface sample as recited by the pending claims or orienting a hemisphere inwardly for a propagation of a secondary wave in a second medium, and outwardly for a propagation of the secondary wave in a first medium, none of Placko et al., Tsingos, or the Optical Microscopy Primer can render pending claims 1-30 obvious.

Conclusion

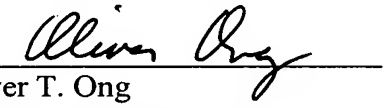
Applicants submit that this case is in a condition for immediate allowance. For the foregoing reasons and for other reasons clearly apparent, Applicants respectfully request reconsideration and allowance of rejected claims 1-30.

If there are matters that can be discussed by telephone to further the prosecution of this application, Applicants respectfully request that the Examiner call its attorney at the number listed below.

The Commissioner is authorized to charge any fee deficiency required by this paper, or credit any overpayment, to Deposit Account No. 13-2855.

Dated: May 30, 2007

Respectfully submitted,

By 

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